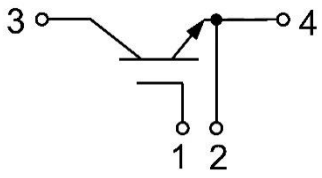
GT150SG120B5H

IGBT Module

Features:

- Field Stop Trench Gate IGBT
- Short Circuit Rated >10μs
- Low Switching Loss
- 100% RBSOA Tested(2×Ic)
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement

Circuit Diagram



Applications:

- Industrial Inverters
- Motor Drives
- UPS Systems

IGBT

Maximum Rated Values of IGBT (T_C=25℃ unless otherwise specified)

V_{CES}	Collector-Emitter Blocking Voltage		1200	V
V_{GES}	Gate-Emitter Voltage		±20	V
I_C	Continuous Collector Current	T_C=100℃	150	A
		T_C=25℃	300	A
I_{CM}	Repetitive Peak Collector Current	tp=1ms	300	A
P_D	Maximum Power Dissipation (per IGBT)	T_C=25℃ T_{Jmax}=175℃	938	W

Electrical Characteristics of IGBT (T_C=25℃ unless otherwise specified)

Static Characteristics

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	I_C=5.3mA, V_{CE}=V_{GE}		5.0	5.8	6.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=150A, V_{GE}=15V	T_J=25℃		1.65	2.00	V
			T_J=125℃		1.90		V
			T_J=150℃		1.95		V
I_{CES}	Collector-Emitter Leakage Current	V_{GE}=0V, V_{CE}=V_{CES}, T_J=25℃				1	mA
I_{GES}	Gate-Emitter Leakage Current	V_{GE}=±20V, V_{CE}=0V, T_J=25℃				±200	nA
C_{ies}	Input Capacitance	V_{CE}=25V, V_{GE}=0V, f=100kHz			16.5		nF
C_{oes}	Output Capacitance				2.5		nF
C_{res}	Reverse Transfer Capacitance				0.5		nF

Switching Characteristics

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
$t_{d(on)}$	Turn-on Delay Time	V_{CC}=600V, I_C=150A, R_{Gon}=6.8Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		437		ns
			T_J=125℃		449		
			T_J=150℃		454		
t_r	Rise Time		T_J=25℃		111		ns
			T_J=125℃		130		
			T_J=150℃		133		
$t_{d(off)}$	Turn-off Delay Time	V_{CC}=600V, I_C=150A, R_{Goff}=6.8Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		389		ns
			T_J=125℃		409		
			T_J=150℃		414		
t_f	Fall Time		T_J=25℃		262		ns
			T_J=125℃		454		
			T_J=150℃		454		
E_{on}	Turn-on Switching Loss	V_{CC}=600V, I_C=150A, R_{Gon}=6.8Ω, V_{GE}=±15V, di/dt=964A/μs(T_J=150℃), Inductive Load	T_J=25℃		15.6		mJ
			T_J=125℃		21.2		
			T_J=150℃		22.6		

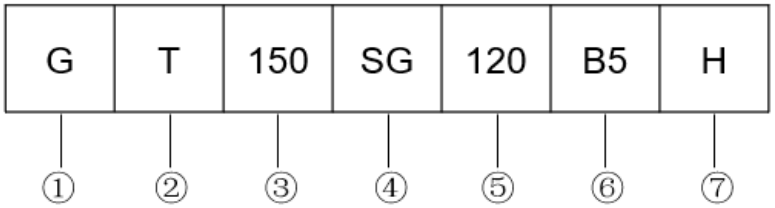
E_{off}	Turn-off Switching Loss	V_{CC}=600V, I_C=150A, R_{Goff} =6.8Ω, V_{GE}=±15V, du/dt=3545V/μs(T_J=150℃), Inductive Load	T_J=25℃		10.4		mJ
			T_J=125℃		15.4		
			T_J=150℃		16.0		
Q_g	Total Gate Charge	V_{GE}=+15V…-15V	T_J=25℃		1164		nC
$R_{g\ internal}$	Internal Gate Resistor		T_J=25℃		4.5		Ω
SCSOA	Vcc=600V, t_p=10us, V_{GE}=+/-15V, R_{Gon}=6.8Ω, R_{Goff}=6.8Ω, T_J=150℃				630		A
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-to-Case					0.16	℃/W

Module

Symbol	Description		Min.	Typ.	Max.	Units
V_{ISO}	Isolation Voltage (All Terminals Shorted)	f=50Hz, 30s		4500		V
Internal Isolation				Al_2O_3		
T_J	Maximum Junction Temperature				175	℃
T_{JOP}	Maximum Operating Junction Temperature Range		-40		+150	℃
T_{stg}	Storage Temperature		-40		+150	℃
$R_{\theta CS}$	Case-to-Sink Thermally (Conductive Grease Applied)				0.06	℃/W
CTI	Comparative Tracking Index			200		
T	Power Terminals Screw:M4		1.1		1.5	N·m
T	Mounting Screw:M4		1.1		1.5	N·m
G	Weight			30		g

Ordering Information Table

Device code



① - IGBT Module
② - Trench, Low Switching Losses IGBT
③ - Rated Current (150=150A)
④ - Circuit Configuration: (Single)
⑤ - Rated Voltage (120=1200V)
⑥ - Package Type
⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)

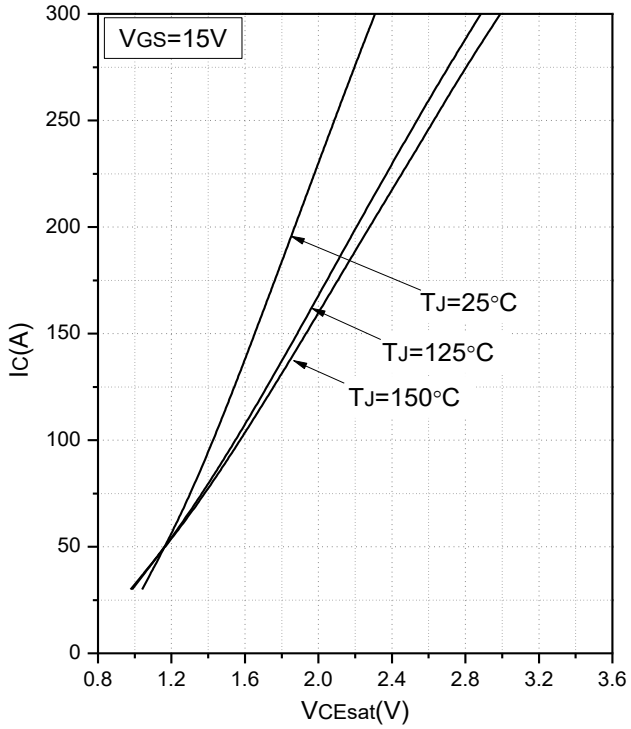


Fig.1 Typical Saturation Voltage Characteristics

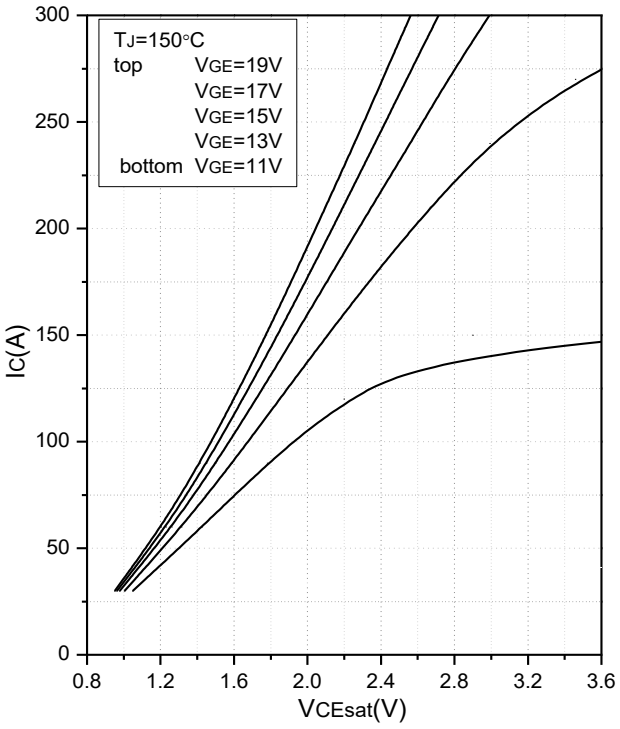


Fig.2 Typical Output Characteristics

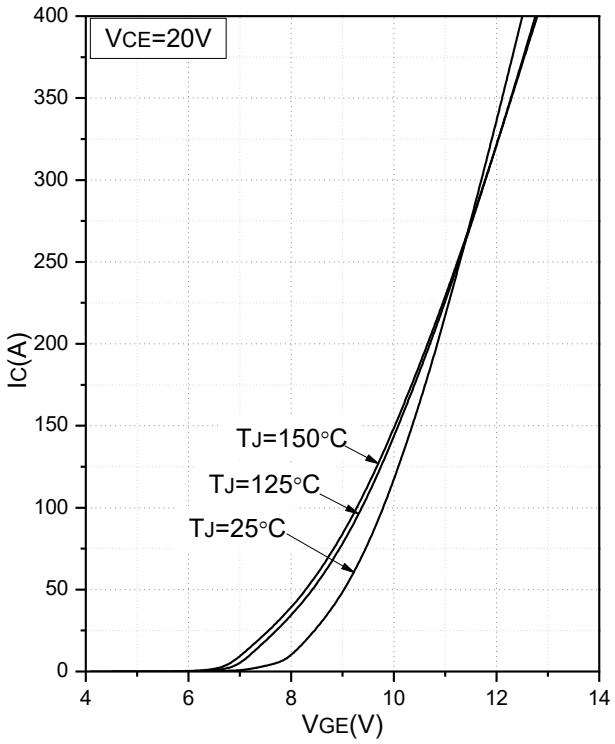


Fig.3 Transfer Characteristics

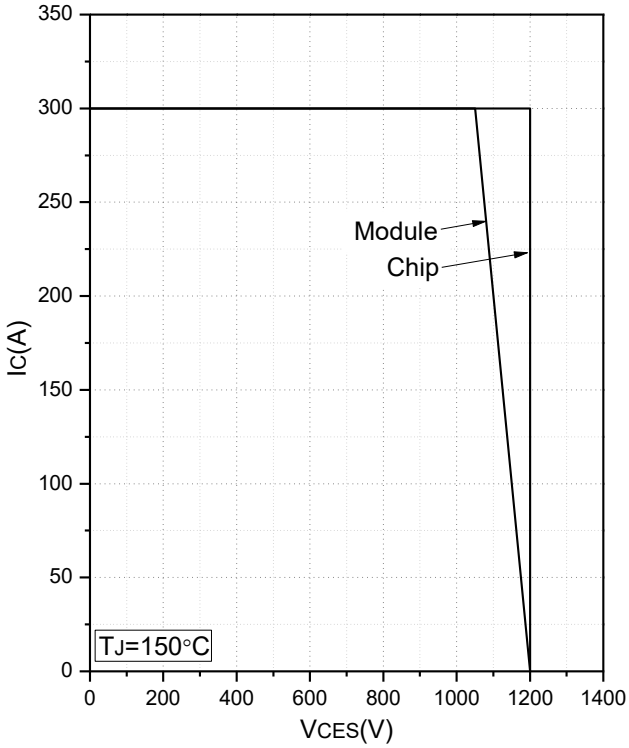


Fig.4 Reverse Bias Safe Operation Area (RBSOA)

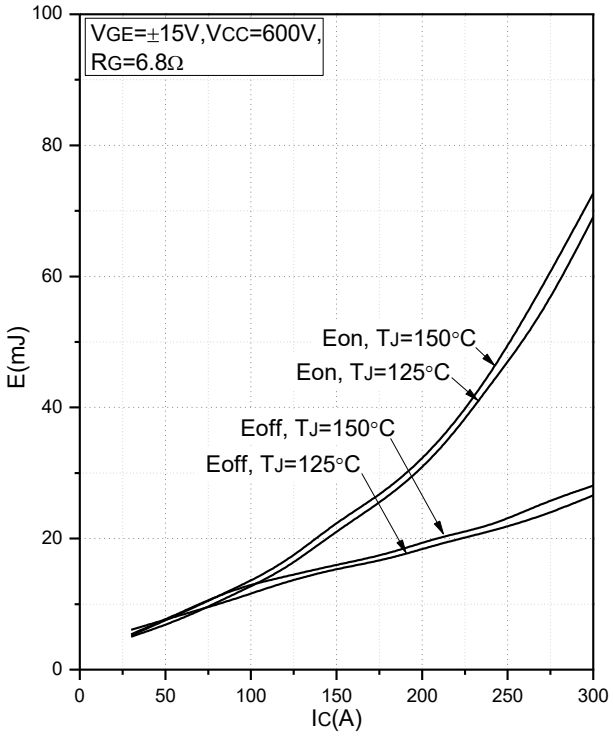


Fig.5 Typical Switching Loss vs. Collector Current

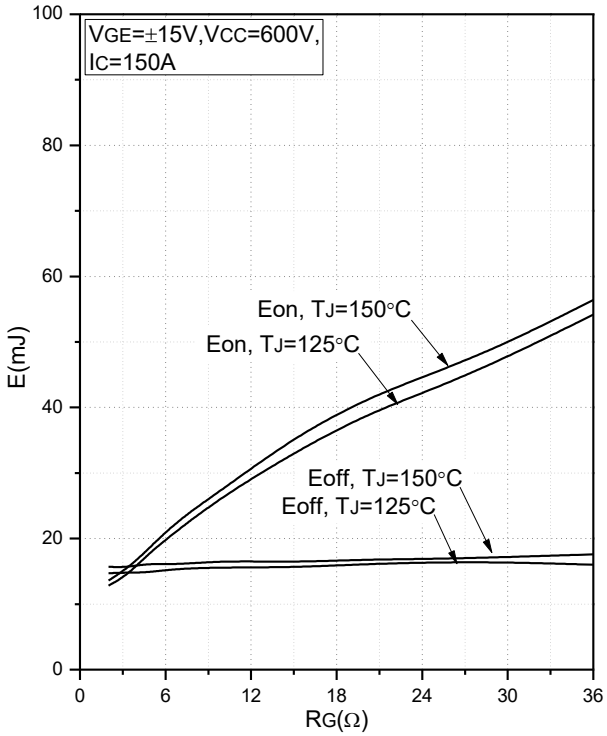


Fig.6 Typical Switching Loss vs. Gate Resistance

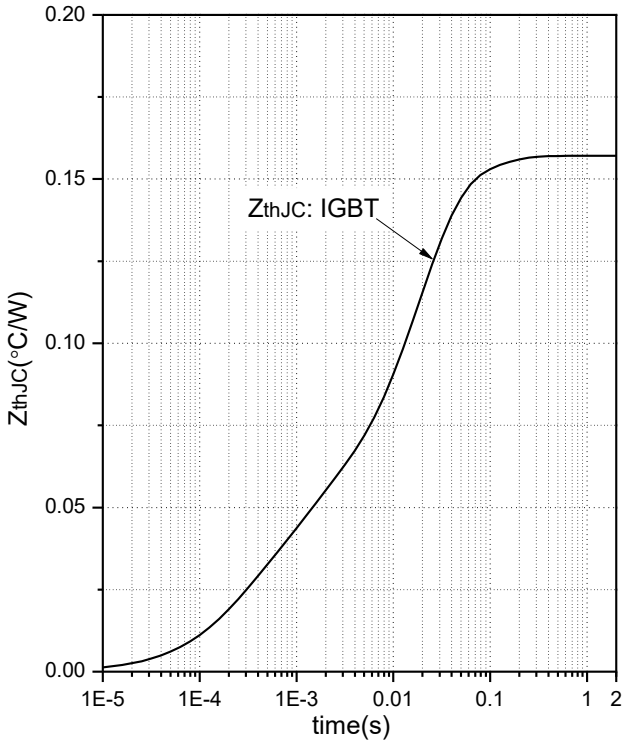


Fig.7 Transient Thermal Impedance (IGBT)

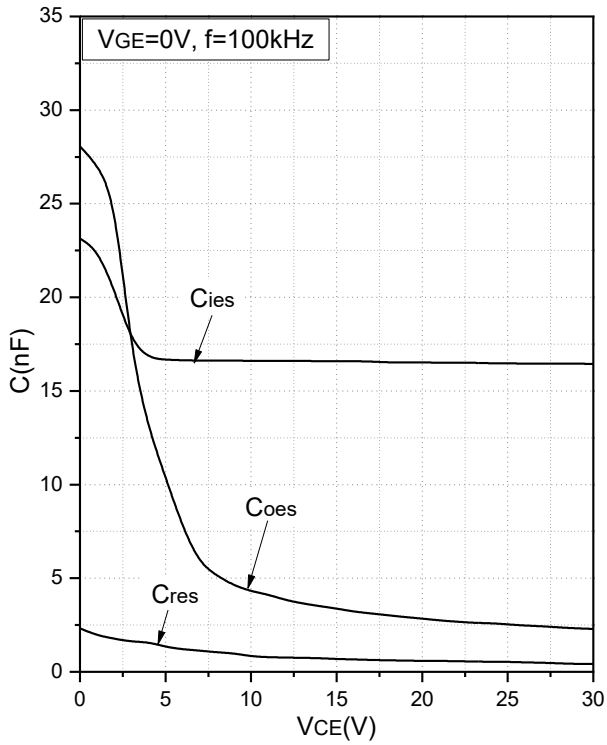
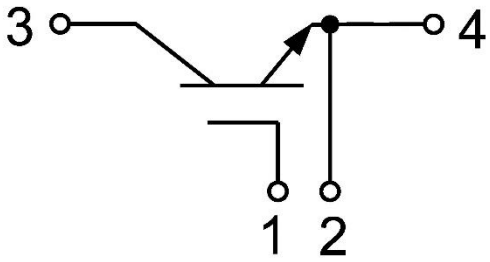
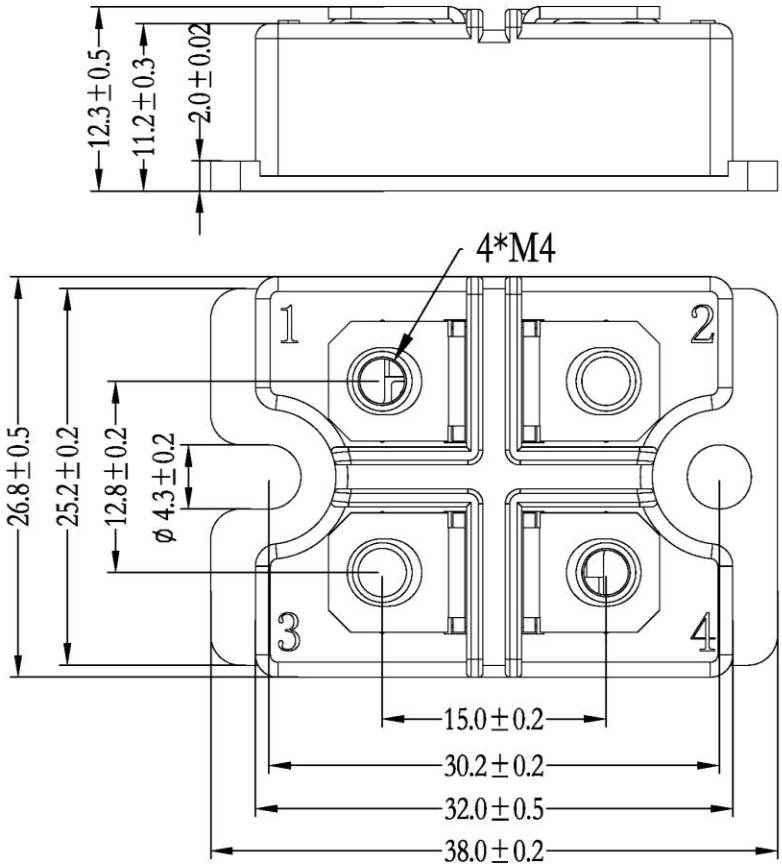


Fig.8 Capacitance Characteristics

Internal Circuit



Package Outline (Unit: mm):



Revision	Notes
A	Final Version

Announcement

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The released datasheet would be issued with “REV.” + “alphabet characters”.